

LESLIE® SPEAKER
MODEL 760



Leslie®
SPEAKERS

"PIPE VOICE OF THE
ELECTRIC ORGAN"®

owner's
manual
model
760

Installation Instructions
Service Information
Parts List

electro  music

Pasadena, California

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THE LESLIE® SPEAKER MODEL 760

GENERAL OPERATING AND MAINTENANCE INSTRUCTIONS

INTRODUCTION

LESLIE SPEAKER MODEL 760

The Model 760 is a two channel speaker incorporating solid state circuitry throughout. It has a total undistorted output of 90 Watts RMS.

Model 760 was designed for use with a wide variety of organs. In fact, all organ models adaptable to the Model 825 will work with the Model 760. The Combo Preamp II provides the necessary amplification and connections for mating the 760 Speaker to a combo organ. Other types of organs may also be adapted to the speaker by using the Model 825 Speaker Console Connector Kit which is recommended for your organ make and model.

Tracing the signal path through the unit with the aid of the Block Diagram below, you will note organ signal is divided at 800 Hz into higher and

lower frequencies by the Crossover Network. Higher frequency signal is channeled to the Treble Amp, where it is amplified to drive the treble speaker mounted beneath the treble rotor.

Lower frequency signal is amplified by the Bass Amplifier, then directed to the 15" bass speaker mounted above the bass rotor.

Upper and lower motor assemblies within the Model 760 propel the bass and treble rotors at the fast tremolo or slow chorale speed. These motors are controlled by the tremolo control provided in the console connector kit or the tremolo foot switch mounted on the Combo Preamp II chassis. Both rotors can be stopped by the Brake Circuit incorporated in the Model 760 Power Supply. For an explanation of these circuits, see the MOTOR CONTROL AND BRAKE CIRCUIT OPERATION section of this manual.

BLOCK DIAGRAM: LESLIE SPEAKER MODEL 760

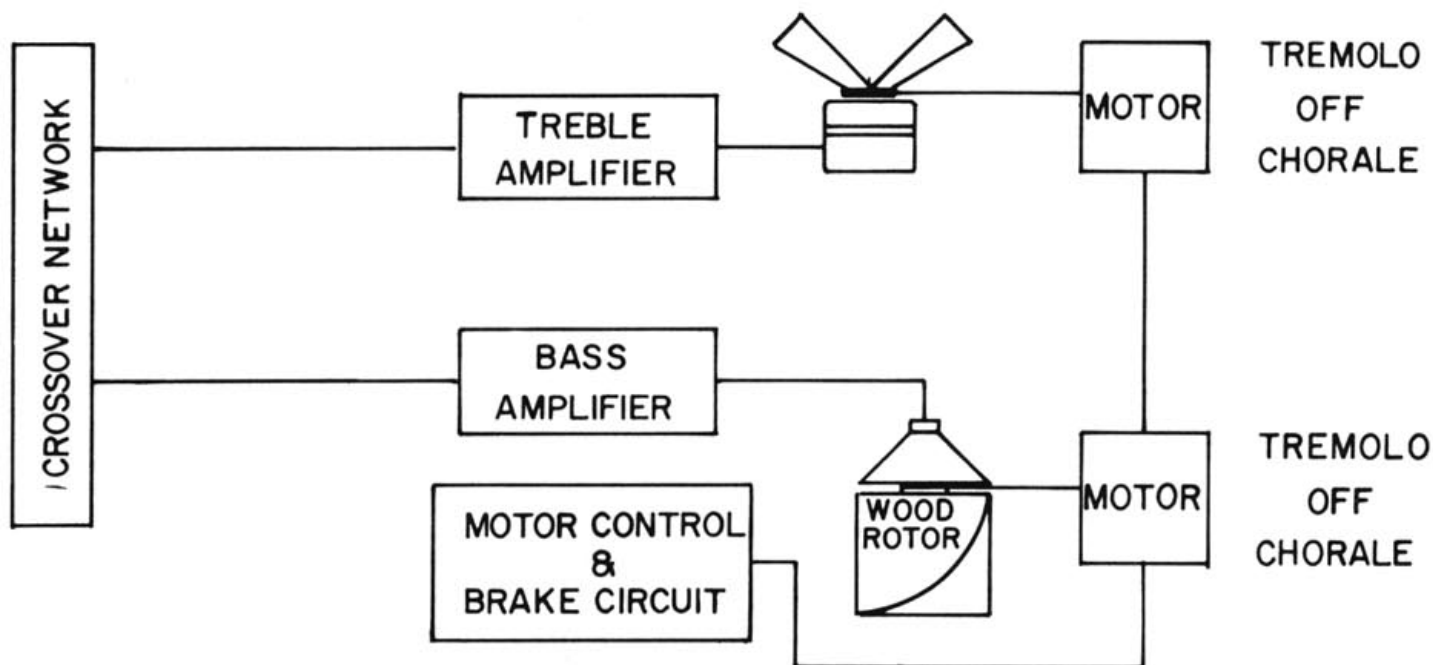


Fig. 1

SPECIFICATIONS

Cabinet

Dimensions: 41 $\frac{1}{8}$ " x 29" x 20 $\frac{1}{2}$ ".

Amplifiers: Bass and Treble amps are solid state units mounted on separate circuit boards. Total output: 90 Watts RMS.

Crossover Network: Solid state unit mounted on its own circuit board. Frequency division occurs at 800Hz.

Power Requirement: 135 Watts, 1.6 Amps @ 234/250 VAC, 50/60Hz.

Fuse: All Voltages: 1 Amp Slo-Blo.

Bass Rotor: A wooden unit, 17" dia. x 9" high. Rotates at approximately 390 RPM in tremolo mode; 40 RPM in chorale mode.

Treble Rotor: Consists of black plastic horn mounted on a spindle assembly. Rotates at approximately 390 RPM in tremolo mode, 40 RPM in chorale mode.

Guarantee: The speaker is guaranteed against all defects in materials and workmanship for one year from date of purchase. This guarantee does not cover belts or speaker cones, which may wear out sooner due to severe usage.

LESLIE ACCESSORIES

All items listed below are available through your franchised Leslie™ Speaker dealership. Use EMI Numbers provided when ordering to assure positive identification.

COMBO PREAMP II — Used to connect the 760 Speaker to Combo organs and guitars. Specify EMI No. 044388 for 234/250 V, 50/60Hz installations.

CONSOLE CONNECTOR — The appropriate Model 825 type Console Connector for your organ may be used in a Model 760 installation. Consult the LESLIE Data Sheet for your model and make of organ.

POWER RELAY — Used for adding Speakers in multiple installations. Specify EMI No. 047738.

SPEAKER CABLE — Nine conductor cable designed to attach the Model 760 Speaker to a Console Connector or Combo Preamp II. Specify EMI No. 021600.

OILER — Comes in a handy tube; perfect for motor and rotor lubrication. Specify EMI No. 053025.

OPERATION

PREPARING MODEL 760 FOR USE

1. Remove any packing material.
2. Install console connector or Combo Preamp II to the organ according to instructions packed with these units.
3. Connect the Model 760 to the console connector or Combo Preamp II with speaker cable provided.
4. When the 760 Speaker is connected to the organ with a console connector, adjust speaker volume according to VOLUME ADJUSTMENT section of this manual. When speaker is connected to organ with a Combo Preamp II, follow volume control adjustment instructions given in the INSTALLATION section of the Combo Preamp II Owner's Manual. Model 760 is now ready to operate.

VOLUME ADJUSTMENT

Due to variations or organ-speaker combinations and in musical taste, there are no definite volume control settings for the Model 760. However, the following procedure should facilitate a satisfactory volume control adjustment.

1. Back off Master Volume Control about halfway.
2. Have someone hold a chord encompassing the organ's entire frequency range with the expression pedal on full.
3. Set volume controls of the Bass and Treble amplifiers according to your musical preference.
4. Turn up Master Volume Control gain until distortion is evident. Decrease Master Volume Control gain until distortion just disappears.

CONSOLE CONNECTOR CONTROLS

There are two controls included in console connector kits designed for use with the Model 760: An echo control and a tremolo control. The echo control turns the speaker on and off. The tremolo control varies the speed of the bass and treble rotors for contrasting tremolo and chorale effects. The echo control permits the organist to play the organ's internal speaker and the Model 760 separately or together.

Here is a description of the echo and tremolo control functions:

TREMOLO CONTROL

TREMOLO Position: Bass and treble rotors spin at approximately 390 RPM.

OFF Position: Bass and treble rotors are stopped.

CHORALE Position: Bass and treble rotors spin at approximately 40 RPM.

ECHO CONTROL

MAIN Position: Only internal organ speaker operates.

ENSEMBLE Position: Internal organ speaker and external Speaker operate.

ECHO Position: Only external Speaker operates.

SPEAKER CABLE 021600

The 9 conductor connector cable is supplied in a 30 foot length, complete with plug and socket. If the distance between the organ (or Combo Preamp II) and speaker exceeds 30 feet, two or more 021600 speaker cables may be connected in series. If a specific cable length other than 30 feet or 30 foot multiples is required, bulk cable 038414 may be ordered. Specify length needed. Also, order a 061879 plug, a 028837 socket, and two 010322 caps for assembling the speaker cable. Wire the plug and socket according to Fig. 2, following the color code exactly.

DIAGRAM: SPEAKER CABLE 021600



Fig. 2

MULTIPLE SPEAKER INSTALLATIONS

When requirements of volume and sound distribution exceed what can be obtained from one Model 760 Speaker, additional speakers should be added to achieve the proper acoustical balance. Each added speaker is connected by means of a 234/250V, EMI No. 047738 power relay available through your franchised LESLIE™ Speaker dealership. The power relay provides a source of AC power independent of the organ for each added speaker. The added speaker is controlled by the On/Off switch at the organ or the Combo Preamp II.

Procedure For Adding Speakers:

1. Connect first speaker's connecting cable to the power relay.
2. Connect the power relay pigtail to the first speaker.
3. Plug the connecting cable for the additional speaker into the receptacle on the power relay.
4. Attach the other end of this connecting cable to the added speaker.
5. Plug the line cord from the power relay into the nearest AC outlet.

This procedure should be followed, using an additional power relay, for each speaker added.

SPECIAL USES

Broadcasting and Recording:

Here are a few general recommendations for recording and broadcasting:

1. Select a fairly "live" studio.
2. Play the organ at medium to full volume level.
3. Place microphone ten to fifteen feet from the Model 760.
4. Do not place microphone at same height as the upper cabinet.

Non-Organ Use:

This speaker will function satisfactorily only in its intended use as a musical instrument. No other applications are recommended.

SERVICE

CAUTION: A. Extreme care should be taken to keep hands and tools away from the rotors when adjustments are made inside the speaker cabinet. Because of the weight and momentum of the bass rotor, there is some danger of injury to the serviceman or to the LESLIE components.

B. Turn off power at the organ or Combo Preamp II before connecting or disconnecting the speaker cable.

LINE VOLTAGE

Line voltage lower than 200 volts in 234 volt models (234 volts in 250 volt speakers), will result in distortion and lack of power. Line voltage in excess of 260 volts in 234 volt models (271 volts in 250 volt models) will cause overheating with possible component damage. A voltage regulating device should be used if the line voltage varies beyond these limits.

ORDERING PARTS:

Standard hardware, connectors, and electronic components may be obtained locally. Non-standard items should be ordered by EMI Numbers listed in this manual through your franchised LESLIE™ Speaker dealership. Speaker model and serial number would be helpful when ordering.

ELECTRONIC SERVICING

AMPLIFIER

The two channel amplifier in the Model 760 is engineered for long, trouble-free operation. Solid-state circuits are used throughout.

The Bass and Treble amplifiers are mounted on separate circuit boards. These boards are mounted to the anodized lower back panel of the speaker cabinet, which also serves as a heat sink for the output transistors. (Hereafter in this manual, the lower back panel will be referred to as the heat sink.)

The amplifier leads are long enough to allow the heat sink to be laid flat for servicing. The long leads also permit the printed circuit boards to be removed from the heat sink and turned over without being disconnected from the circuit. If a circuit board is defective, it may be easily replaced as a complete unit.

VOLTAGE CHECKS

Detach the circuit board in question from the heat sink (4 nuts) and set it on edge to expose the foil pattern. Leave all wires connected. Check the voltages on the board at the various test points indicated on the circuit board drawing. Voltages given are approximate, and will vary $\pm 10\%$ under normal "no-signal" operating conditions.

All voltage measurements except base and emitter voltages of Q13, Q14, Q17, and Q18 should be made between test point and ground using a 20K ohm/voltmeter. The bases of output transistors Q13, Q14, Q17, and Q18 should be $+0.5$ volt higher than their emitters. This can be measured by touching the voltmeter probes to the base and emitter of the output transistor being tested.

IMPORTANT: Replacement output transistor(s) for Bass channel should be matching green, blue, violet, or white-coded transistors. Use a thin, smooth layer of thermal compound on **both** surfaces of the mica washer separating the transistor(s) from the heat sink.

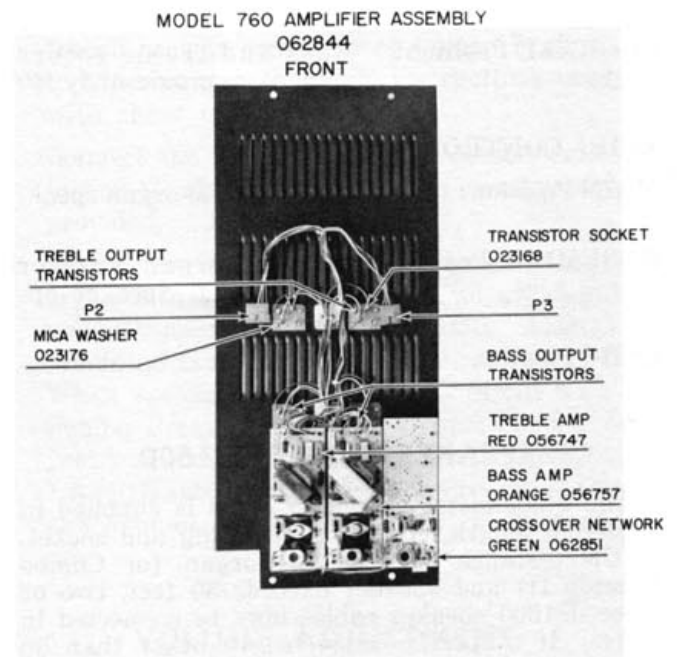


Fig. 3

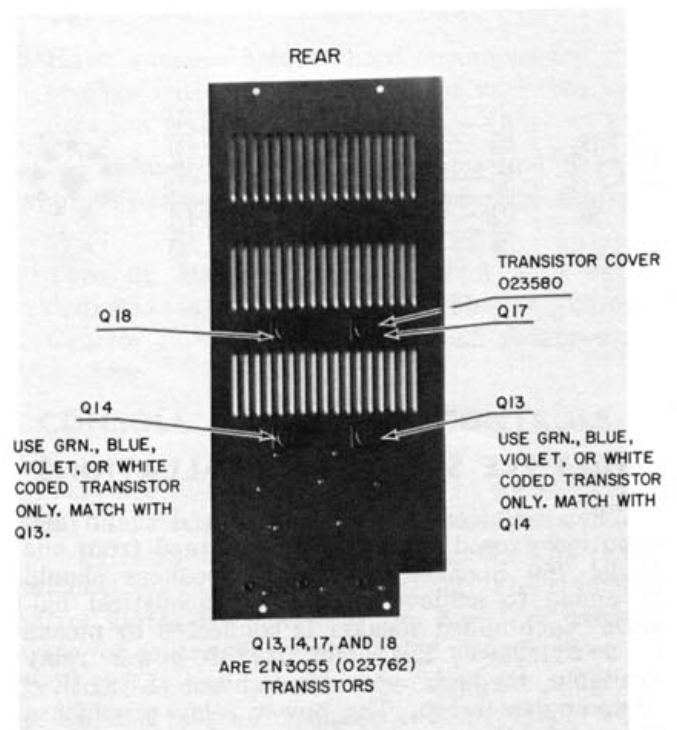


Fig. 4

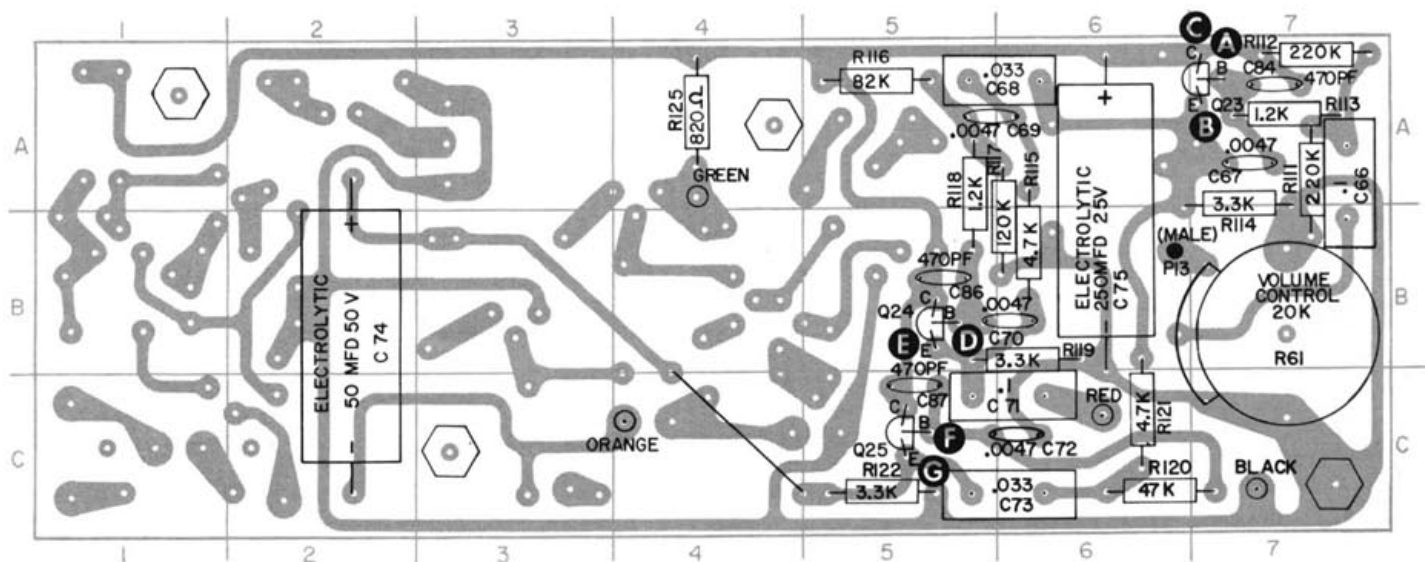


Fig. 5

Crossover Network Voltages

A	+10
B	+9.5
C	+21.5
D	+12.5
E	+12
F	+9.5
G	+9.0

CROSSOVER NETWORK CIRCUIT ASSEMBLY

062851

Part	Location	Description	EMI. No.
R61	B7	20K	Potentiometer 037648
R111	A7	220K	Resistor 013615
R112	A7	220K	Resistor 013615
R113	A7	1.2K	Resistor 018036
R114	B7	3.3K	Resistor 024141
R115	B6	4.7K	Resistor 028555
R116	A5	82K	Resistor 027102
R117	A6	120K	Resistor 027078
R118	A5	1.2K	Resistor 018036
R119	B6	3.3K	Resistor 024141
R120	C6	47K	Resistor 028506
R121	C6	4.7K	Resistor 028555
R122	C5	3.3K	Resistor 024141
R125	A5	820 ohm	Resistor 028373
C66	A7	Poly, 0.1MFD @ 200V, 20 %	Capacitor 022251
C67	A7	Ceramic, .0047MFD @ 100V, 10 %	Capacitor 028431
C68	A6	Mylar, .033MFD @ 100V, 10 %	Capacitor 028654
C69	A5	Ceramic, .0047MFD @ 100V, 10 %	Capacitor 028431
C70	B6	Ceramic, .0047MFD @ 100V, 10 %	Capacitor 028431
C71	C6	Poly, 0.1MFD @ 200V, 20 %	Capacitor 022251
C72	C6	Ceramic, .0047MFD @ 100V, 10 %	Capacitor 028431
C73	C6	Mylar, .033MFD @ 100V, 10 %	Capacitor 028654
C74	C4	Elect., 50MFD @ 50V	Capacitor 025262
C75	B6	Elect., 250MFD @ 25V	Capacitor 024869
C84	A7	Ceramic, 470PF @ 1KV	Capacitor 028662
C86	B5	Ceramic, 470PF @ 1KV	Capacitor 028662
C87	C5	Ceramic, 470PF @ 1KV	Capacitor 028662
Q23	A7	MSPS 4382	TSTR 026237
Q24	B5	MSPS 4382	TSTR 026237
Q25	C5	MSPS 4382	TSTR 026237

All resistors 1/2 W, 10 % unless noted otherwise.

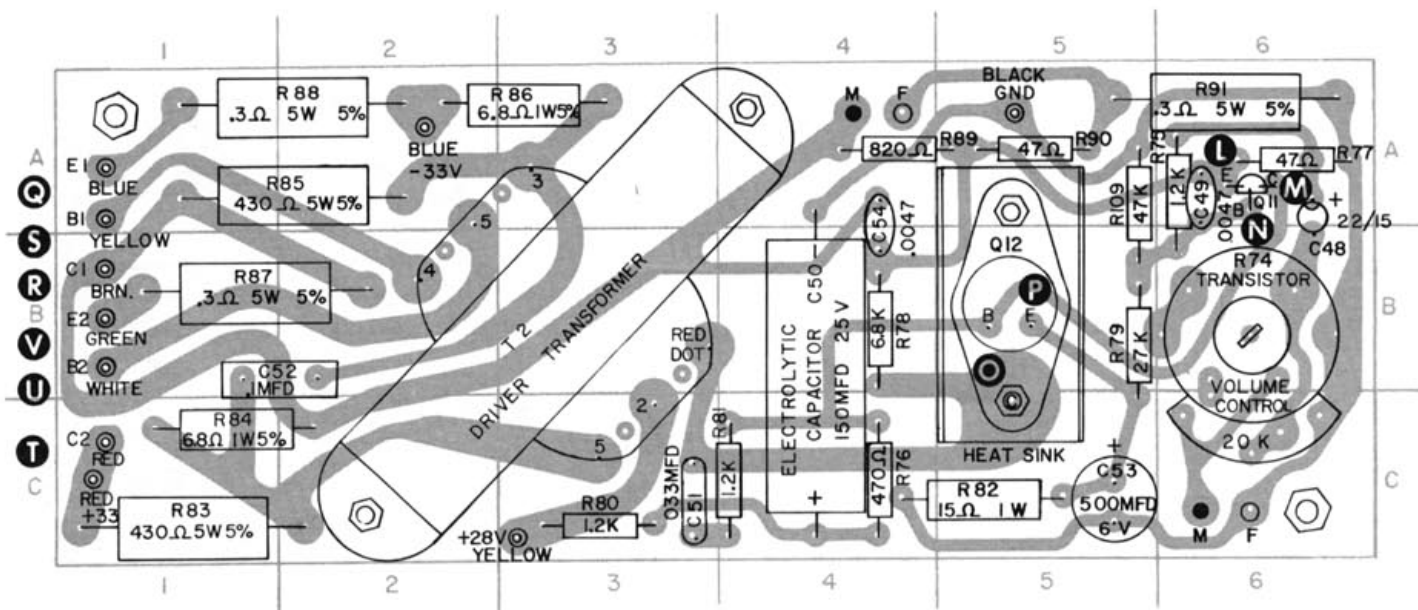


Fig. 6

Bass Amplifier Voltages

L	+0.4
M	+2.8
N	+1.2
O	+28
P	+2.2
Q	-32
R	0
S	Note
T	+43
U	0
V	Note

Note: +0.5V difference between Q-S;
U-V. Base is +.5V more positive than emitter.

BASS AMPLIFIER CIRCUIT ASSEMBLY

056754

Part	Location	Description	EMI. No.
R74	B5	20K, Potentiometer	Resistor 037648
R75	A6	1.2K	Resistor 018036
R76	C4	470 ohm	Resistor 028068
R77	A6	47 ohm	Resistor 016311
R78	B4	6.8K	Resistor 016501
R79	B5	27K	Resistor 020834
R80	C3	1.2K	Resistor 018036
R81	C4	1.2K	Resistor 018036
R82	B5	15 ohm, 1W	Resistor 031823
R83	C1	430 ohm, 5W, 5%, Wire Wound	Resistor 023648
R84	C1	6.8 ohm, 1W, 5%	Resistor 055475
R85	A1	430 ohm, 5W, 5%, Wire Wound	Resistor 023648
R86	A3	6.8 ohm, 1W, 5%	Resistor 055475
R87	B1	0.3 ohm, 5W, 5%, Wire Wound	Resistor 023218
R88	A1	0.3 ohm, 5W, 5%, Wire Wound	Resistor 023218
R89	A5	820 ohm	Resistor 028373
R90	A5	47 ohm	Resistor 016311
R91	A6	0.3 ohm, 5W, 5%, Wire Wound	Resistor 023218
R109	B5	47K	Resistor 028506
C48	B6	Tantalum, 22MFD @ 15V	Capacitor 062638
C49	A6	Ceramic, .0047MFD @ 100V, 10%	Capacitor 028431
C50	B4	150MFD @ 25V	Capacitor 031294
C51	C3	Elect., Mylar, .033MFD @ 100V, 10%	Capacitor 028654
C52	B1	Poly, 0.1MFD @ 200V, 20%	Capacitor 022251
C53	C5	Elect., 500MFD @ 6V	Capacitor 055483
C54	A4	Ceramic, .0047MFD @ 100V, 10%	Capacitor 028431
Q11	A6	Transistor MSPS 4382	026237
Q12	B5	Transistor, Driver, 2N3054	023754
T2	B3	Transformer, Driver	023770
	B5	Heat Sink, Q12	045674

All resistors 1/2 W, 10% unless noted otherwise.

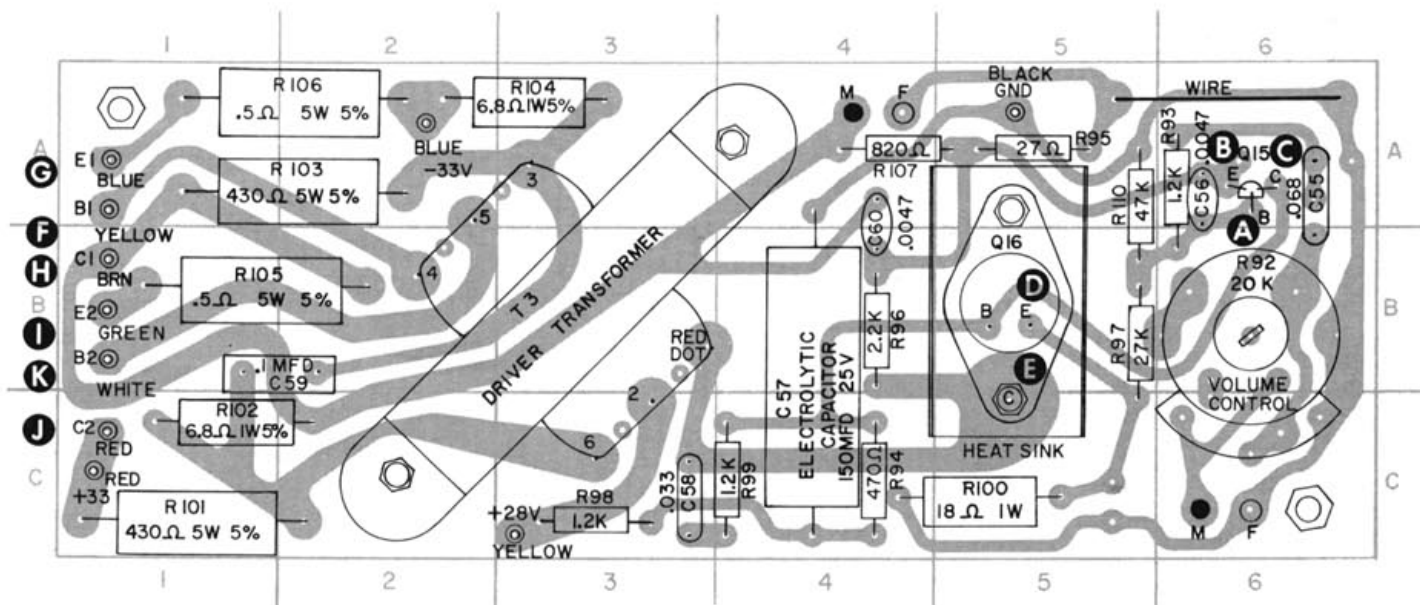


Fig. 7

Treble Amplifier Voltages

A	+1.4
B	+0.7
C	+3.2
D	+2.6
E	+27
F	Note
G	-42
H	0
I	0
J	+42
K	Note

Note: 0.5V difference between F-G;
I-K. Base is +.5V more positive than emitter.

TREBLE AMPLIFIER CIRCUIT ASSEMBLY

056747

Part	Location	Description	EMI. No.
R92	B6	20K, Potentiometer	Resistor 037648
R93	A6	1.2K	Resistor 018036
R94	C4	470 ohm	Resistor 028068
R95	A5	27 ohm	Resistor 021253
R96	B4	2.2K	Resistor 028571
R97	B5	27K	Resistor 020834
R98	C3	1.2K	Resistor 018036
R99	C4	1.2K	Resistor 018036
R100	C5	18 ohm, 1W	Resistor 031146
R101	C1	430 ohm, 5W, 5%, Wire Wound	Resistor 023648
R102	C1	6.8 ohm, 1W, 5%	Resistor 055475
R103	A2	430 ohm, 5W, 5%, Wire Wound	Resistor 023648
R104	A3	6.8 ohm, 1W, 5%	Resistor 055475
R105	B1	0.5 ohm, 5W, 5%, Wire Wound	Resistor 023200
R106	A2	0.5 ohm, 5W, 5%, Wire Wound	Resistor 023200
R107	A4	820 ohm	Resistor 028373
R110	A5	47K	Resistor 028506
C55	A6	Poly, .068MFD @ 250V, 20%	Capacitor 031393
C56	A6	Ceramic .0047MFD @ 100V, 10%	Capacitor 028431
C57	C4	Elect., 150MFD @ 25V	Capacitor 031294
C58	C3	Mylar, .033MFD @ 100V, 10%	Capacitor 028654
C59	B2	Poly, 0.1MFD @ 200V, 20%	Capacitor 022251
C60	B4	Ceramic .0047MFD @ 100V, 10%	Capacitor 028431
Q15	A6	Transistor, MSPS 4382	026237
Q16	B5	Transistor, 2N3054	023754
T3	B3	Transformer, Driver	023788
	B5	Heat Sink, Q16	045674

All resistors 1/2 W, 10% unless noted otherwise.

POWER SUPPLY

The power supply is located in the lower section of the cabinet. In addition to providing power for the speaker components, the power supply contains the motor control and braking circuits described later in this section.

POWER SUPPLY TRANSFORMER

Removal:

1. Remove power supply. Turn it upside down.
2. Unsolder wires attached to the circuit board foil pattern.
3. Remove the four circuit board mounting nuts. Lift circuit board off its mounting studs to expose four transformer mounting nuts on the underside of the power supply chassis.
4. Remove transformer mounting nuts and lift transformer off the power supply chassis.

Replacement:

Reverse removal procedure. Use Fig. 10 as a guide when rewiring circuit board.

234-250 VOLT CONVERSION

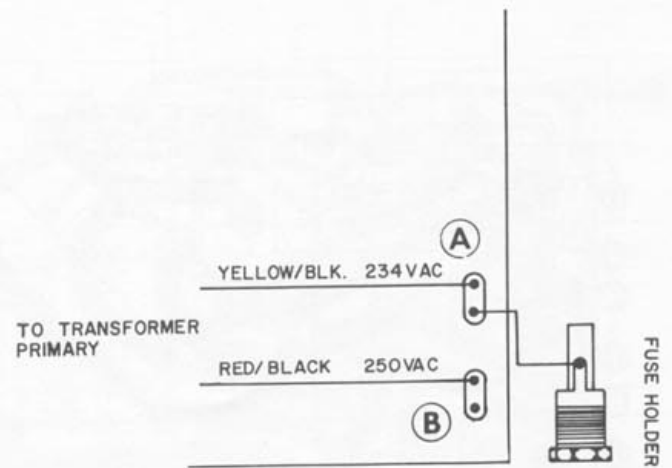


Fig. 9

234-250 VOLT CONVERSION

The primary of the power transformer is equipped to adapt to either 250 or 234 volt service. The power supply must be removed and turned upside down to make the change. Unsolder the wire from its present location and resolder it to the desired primary voltage terminal as shown in the diagram.

NOTE: Do not remove the wire from its connection at the side of the fuse holder. The connections for the conversion are made at the terminals on the circuit board.

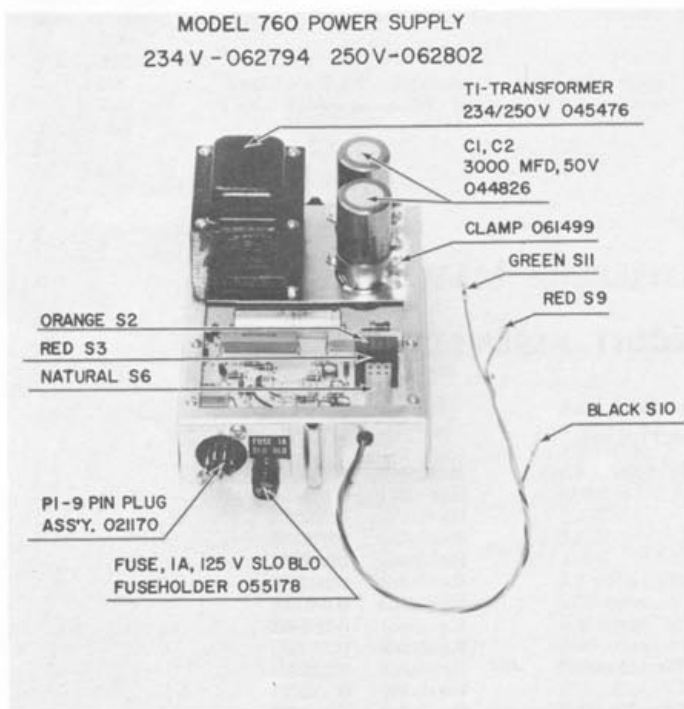


Fig. 8

POWER SUPPLY CIRCUIT BOARD ASSEMBLY

Part	Location	Description	EMI. No.
C1*	D5	Capacitor, Electrolytic, 3000 Mfd, 50V	044826
C2*	D4	Capacitor, Electrolytic, 3000 Mfd, 50V	044826
C3	B3	Capacitor, Electrolytic, 1000 Mfd, 35V	023507
C4	A3	Capacitor, Tantalum, 22 Mfd, 15V	062638
D1	A2	Rectifier, Silicon, 30 PIV, 500 MW	041616
D2	D3	Rectifier, Silicon, 200 PIV, 3 Amp	031450
D3	D3	Rectifier, Silicon, 200 PIV, 3 Amp	031450
D4	D3	Rectifier, Silicon, 200 PIV, 3 Amp	031450
D5	D3	Rectifier, Silicon, 200 PIV, 3 Amp	031450
D6	C2	Rectifier, SCR, 400 PIV, 4 Amp	031997
D7	C2	Rectifier, SCR, 400 PIV, 4 Amp	031997
D8	C1	Rectifier, SCR, 400 PIV, 4 Amp	031997
D9	C1	Rectifier, SCR, 400 PIV, 4 Amp	031997
D10	A2	Rectifier, Silicon, 30 PIV, 500 MW	041616
D11	B2	Rectifier, Silicon, 30 PIV, 500 MW	041616
D12	A1	Rectifier, Silicon, 30 PIV, 500 MW	041616
D13	B2	Rectifier, Silicon, 30 PIV, 500 MW	041616
FZ1 (not shown)		Fuse, 1 Amp, 125V "Slo-Blo"	038158
Q1	A3	Transistor, MSPS 4382	026237
Q2	A2	Transistor, 2N3414	030254
Q3	B1	Transistor, 2N3414	030254
R1	B2	Resistor, Wire Wound, 200 Ohm, 10 Watt, 10%	049767
R2	D2	Resistor, Wire Wound, 32 Ohm, 10 Watt, 10%	029769
R3	B2	Resistor, 22K Ohm, 1/2 Watt, 10%	028530
R5	A3	Resistor, 680K Ohm, 1/2 Watt, 10%	062646
R6	A2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R7	B2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R8	A2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R9	B2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R10	B2	Resistor, 6.8K Ohm, 1/2 Watt, 10%	016501
R11	A1	Resistor, Wire Wound, 130 Ohm, 5 Watt, 10%	023739
R12	C2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R13	B2	Resistor, 10K Ohm, 1/2 Watt, 10%	028548
R14	C2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R15	C1	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R16	C1	Resistor, 10K Ohm, 1/2 Watt, 10%	028548
R17	C1	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R18	A2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R19	A2	Resistor, 330 Ohm, 1/2 Watt, 10%	016493
R20	C2	Resistor, 15 Ohm, 1/2 Watt, 10%	018051
Rel 1	C1	Coil, Reed Switch	023150
Rel 1	C1	Switch, Reed	023747
Rel 2	B1	Coil, Reed Switch	023150
Rel 2	B1	Switch, Reed	023747

9

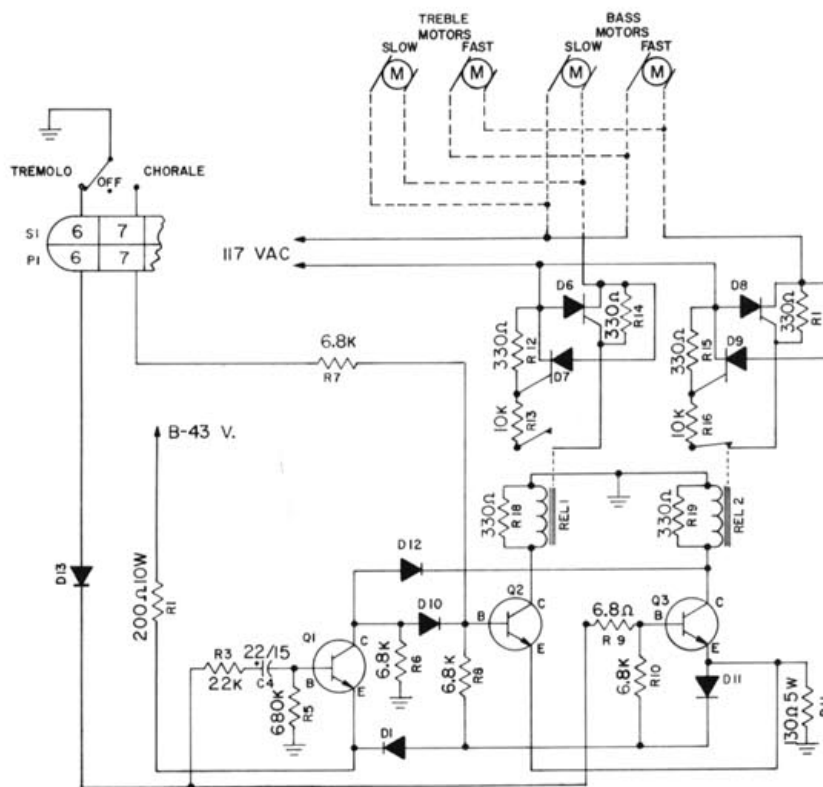


Fig. 11

MOTOR AND BRAKE CIRCUIT OPERATION

Refer to figure 11. Note that motor circuitry is switched for fast (large) motor operation.

SLOW MOTOR OPERATION (Small Motors Actuated)

When the speaker control is switched to CHORALE, pin 7 is grounded. Current flows through resistor R7. Transistor Q2 conducts. Relay 1 closes, triggering the gates of silicon controlled rectifiers D6 and D7. This permits AC current to actuate the slow (small) motors.

FAST MOTOR OPERATION (Large Motors Actuated)

When the speaker control is switched to TREMOLO, pin 6 is grounded. Current flows through diode D13 and resistor R9. Transistor Q3 conducts. Relay 2 closes, triggering the gates of silicon controlled rectifiers D8 and D9, causing AC current to actuate the large (fast) motors.

BRAKE CIRCUIT OPERATION

When the brake circuit is operating, the small motor shaft engages the rim drive wheels of the large motors for a short period to brake the rapidly spinning rotors to a stop.

The brake circuit can only be activated by switching the speaker control from TREMOLO to OFF. This is because capacitor C4, the key element in the brake circuit, charges only when the fast (large) motor is operating.

In tremolo mode, transistor Q1 conducts, drawing current through resistor R6. Diode D10 will be reverse biased, not affecting the base of transistor Q2.

Switching the control from TREMOLO to OFF breaks contact between ground and pin 6. The charge on capacitor C4 causes transistor Q1 to turn off for a time determined by the values of capacitor C4 and resistor R5—about 8 to 13 seconds. Diode D10 becomes forward biased, permitting current to pass through resistor R6, turning on transistor Q2. Relay 1 closes, triggering SCR's D6 and D7. Both slow (small) motors will run for 8 to 13 seconds—the time required to discharge capacitor C4. After capacitor C4 finishes discharging, relay 1 opens, the slow motors stop, and the brake cycle is completed.

MECHANICAL SERVICING MOTOR LUBRICATION AND CLEANING

Use, climate, and dust conditions determine motor lubrication requirements. In normal service, yearly oiling is usually sufficient. However, if the speaker is used several hours a day, more frequent lubrication may be necessary. Motors failing to start immediately may have dried-up, dirt clogged bearings.

To determine if oiling is necessary, press a clean, dry screwdriver against the felt pads surrounding the oilite bearings (two in each motor). If oil is transferred to the screwdriver, the bearings should not be oiled. Remember, over-oiling is just as detrimental to the motors as under-lubrication.

Complete motor disassembly is unnecessary for motor cleaning. A thorough cleaning job can be done with compressed air or a vacuum hose after detaching the small motor from the large motor.

If the motors must be completely disassembled, use Figure 12 as a guide. Use emery paper 3/20 grit or finer to smooth off any burrs or deep scratches on the large motor shaft **before** detaching the large motor end bells. This will prevent damage to the bearings within these end bells.

Also, mark the motor mount brackets and their mounting locations on the end bell when disassembling these parts. Marking assures correct positioning of the brackets during reassembly.

TO LUBRICATE AND CLEAN MOTORS:

1. Remove the motor assembly from the cabinet.
CAUTION: Do not lose the bushings found in the motor mount brackets.
2. Detach the large motor from the small motor by removing its four mounting bracket screws.
3. Remove rim drive wheel assembly from large motor with a 3/32 Allen wrench.
4. Saturate bearing felts at either end of the large motor. (See "OIL FELT," Fig. 13.) Use oiler supplied or any good grade light-weight machine oil. Don't over-lubricate.
6. Remove the shaft adjustment nut from the free end of the small motor's shaft adjustment screw. (See Fig. 13.)
7. Remove the two nuts fastening the small motor to its mounting bracket. Detach the small motor.
8. Use compressed air or a vacuum hose to remove any dust lodged in the end bells of the large motor. If necessary, clean small motor in the same manner.
9. Clean all accessible parts with solvent. Allow motors to dry.
10. Saturate bearing felts at either end of the small motor. (See "OIL HOLE," Fig. 13.)

REASSEMBLING

LARGE AND SMALL MOTORS

1. Reverse disassembly procedure, observing the following:
 - A. Replace the neoprene "O" ring of the rim drive wheel assembly if it is excessively worn. If rough spots exist, twist "O" ring until the outer edge is smooth.
 - B. When installing rim drive wheel assembly on the large motor shaft, push it on as far as it will go; then back it off 1/16th inch.
 - C. Be sure to align rim drive wheel's set screw with the FLAT side of the large motor shaft; then tighten wheel in place.
2. Slip drive belt onto the drive pulley. Then adjust tension of the small motor shaft as described next. Finally, adjust drive belt tension. (See page 13.)

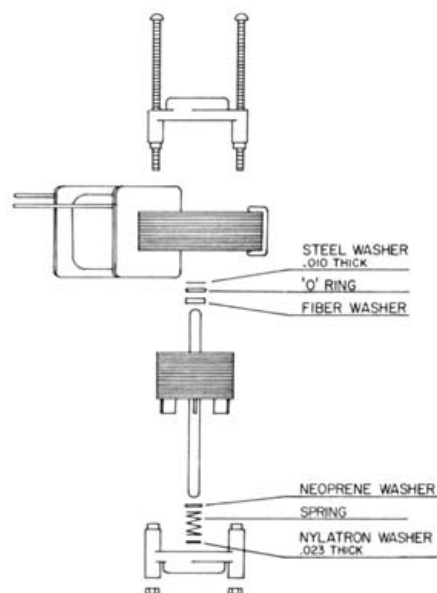
SMALL MOTOR SHAFT

OPERATION AND ADJUSTMENT

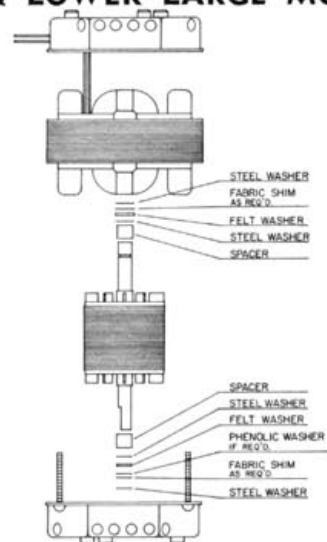
The small motor drives the shaft of the large motor at slow speed by making contact with the rim drive wheel assembly. (See Fig. 13.) The small motor armature is spring loaded, withdrawing from the rim drive wheel assembly when the small motor is not operating.

Switching the tremolo control to CHORALE activates the small motor. The magnetic field set up in the small motor laminations pulls the small motor shaft into contact with the rim drive wheel

UPPER SMALL MOTOR



UPPER & LOWER LARGE MOTOR



LOWER SMALL MOTOR

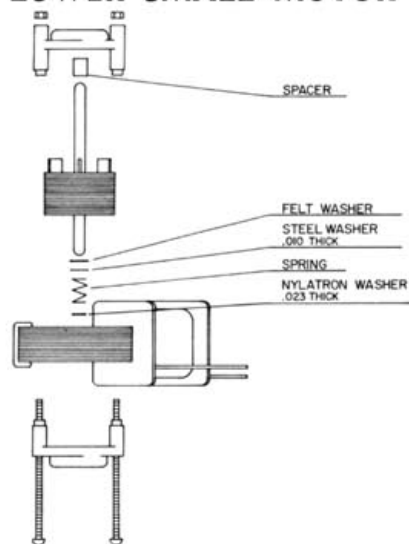


Fig. 12

assembly; thus braking the rotor to the chorale (slow) speed. Contact between the small motor shaft and the rim drive wheel assembly can be adjusted as follows:

1. With speaker power on, switch the tremolo control to CHORALE.
2. Loosen the contact adjustment nuts on the small motor until small motor shaft no longer touches the rim drive wheel assembly. (See Fig. 13.)
3. Grasp treble horn or rotor to prevent its turning.
4. Slowly tighten upper adjustment nut until the small motor shaft forces the drive pulley to turn the drive belt. (See Fig. 13.)
5. Tighten the lower adjustment nut (See Fig. 13) against small motor laminations.
6. Switch the tremolo control between TREMOLO and CHORALE positions to check for proper shaft adjustment. **NOTE:** Make certain the outer edge of the "O" ring on the rim drive wheel is smooth. If unevenness exists, twist the "O" ring until it makes even contact with the small motor shaft when the shaft is engaged.

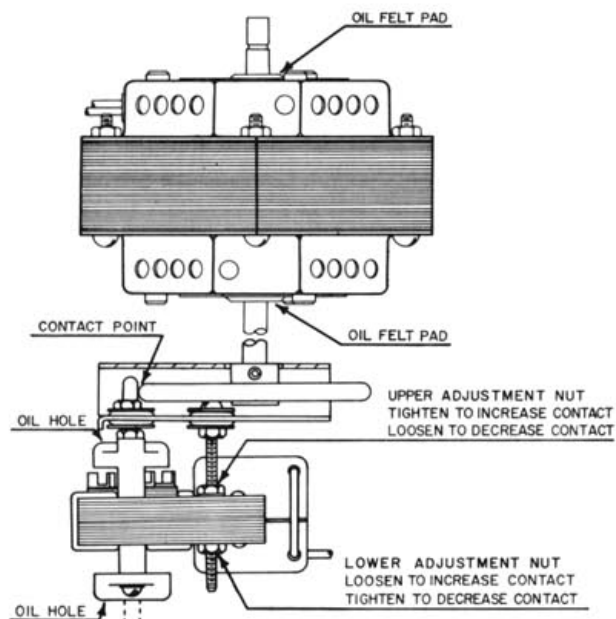


Fig. 13

MOTOR NOISES

Excessive motor noises may indicate misaligned large motor bearings. Lightly tap the large motor laminations with a hammer to reseal the bearings.

DRIVE BELTS

There are two drive belts in the Model 760. If either belt becomes worn, noisy speaker operation may result. A worn drive belt should be replaced.

TREBLE DRIVE BELT

ADJUSTMENT:

This belt drives the treble horn on the upper shelf. Should the treble drive belt become loose, replace it. The speed of the treble horn may be increased or decreased by shifting the treble drive belt to the larger or smaller diameter grooves in the three step pulley on the large motor shaft.

REPLACEMENT:

1. Slip old belt off the three step pulley and idler pulley.
2. Lift old belt over one treble horn, then the other.
3. Install the new belt, reversing removal procedure.

BASS DRIVE BELT

Proper bass drive belt tension is important. An overly tight or loose belt won't usually drive the bass rotor to full tremolo speed. An over-tightened belt may even cause excessive wear on the motor bearings. With a properly adjusted belt, the bass rotor should reach full tremolo speed in about 7 to 10 seconds. The belt will slip slightly on the drive pulley during acceleration. Such slippage is actually necessary for attaining full rotor speed. The belt acts like a torque converter. As it slips, the drive pulley gathers momentum and torque. When the belt catches, the torque increase is transferred to the bass rotor, causing it to rotate faster.

TO CHECK BELT TENSION:

Switch tremolo control from CHORALE to TREMOLO, observing time required for the rotor to reach full speed. Also, listen for any excessive motor noise. This may indicate an over-tightened drive belt.

TO ADJUST BELT TENSION:

1. Loosen the two motor mounting wingnuts.
2. Twist the motor assembly to loosen or tighten belt as required.
3. Tighten the two motor mount wingnuts.
4. Switch tremolo control between CHORALE and TREMOLO, observing time required for the bass rotor to reach tremolo speed. This should take about seven to ten seconds. If it does not, readjust belt tension.

TO REPLACE BELT:

1. Remove both heat sink and middle back.
2. Disconnect the leads from the 15" bass speaker.
3. Remove the screws fastening bass speaker to the shelf. Lift speaker straight up; then out of the cabinet. **CAUTION:** Be careful not to puncture speaker cone with your fingers or with the upper rotor support.
4. Slide the exposed upper rotor support off the rotor shaft.
5. Slip old belt off its pulleys and remove it from the cabinet.
6. Prestretch replacement belt. You might feel the belt "give". This is normal, indicating the belt has been stretched to operating length.
7. Fit replacement belt onto the motor and rotor pulleys. Belt should slip into belt channel in underside of bass speaker shelf.
8. Replace upper rotor support bracket and the bass speaker. **CAUTION:** Be careful not to puncture speaker cone with your fingers or with the upper rotor support.
9. Adjust belt tension as previously outlined.

SPEAKER REPLACEMENT

Due to the extremely strong magnetic field in the loudspeakers, it is inadvisable to attempt cone replacements or any other repairs involving loudspeaker disassembly. Repair or replacement of loudspeaker should be arranged through a franchised LESLIE™ Speaker dealership.

CAUTION: When reinstalling speaker in cabinet, be sure to observe correct polarity of the speaker wires.

TREBLE SPEAKER REPLACEMENT

Disconnect treble speaker wires and remove screws fastening treble speaker to the underside of the upper shelf. To install replacement speaker, reverse removal procedure.

BASS SPEAKER REPLACEMENT

Simply disconnect the speaker leads and remove the screws fastening speaker to the shelf. Then lift speaker straight up and out of the cabinet.

CAUTION: Be careful not to puncture speaker cone with your fingers or the upper rotor support.

BASS ROTOR REPLACEMENT

(See page 15 for exploded view of bass rotor assembly.)

1. Remove heat sink.
2. Remove the 15" bass speaker.
3. Remove the upper rotor support bracket.
4. Slip bass drive belt off the rotor shaft.
5. Pull the rotor shaft up and out of the bass rotor.
6. Remove bass rotor from the cabinet.
7. Install replacement rotor by reversing the removal procedure.

Note the following:

- A. When centering rotor over the lower bearing, lift rotor slightly and sight through shaft hole. Align the lower rotor grommet over the grommet in the lower bearing. Be careful not to dislodge lower bearing's metal washer when inserting the rotor shaft.
- B. Lubricate lower bearing end of the rotor shaft with oil or Vaseline before inserting it through the rotor grommets. The neoprene grommets are not damaged by these lubricants.
- C. The two drive pins in the rotor pulley should straddle one of the wooden divisions between the cutouts in the top of the bass rotor.
- D. Readjust tension of the bass drive belt. (See BASS DRIVE BELT section of this manual.)

BASS ROTOR, UPPER BEARING REPLACEMENT

(See page 15 for exploded view of bass rotor assembly.)

1. Remove bass speaker.

2. Remove top half of bearing clamp. The ball bearing can now be lifted out and replaced. If a newly installed bearing seems slightly loose, remove the bearing support assembly from the cabinet. Disassemble and bend the lower half of the bearing clamp so it will apply more pressure on the ball bearing.

BASS ROTOR, LOWER BEARING REPLACEMENT

(See page 15 for exploded view of bass rotor assembly.)

1. Lay cabinet on floor so that bottom is accessible.
2. Remove the two screws that fasten the bearing mounting plate to the cabinet, and remove lower bearing assembly from the shaft. Be sure to save the flat metal washer between the rotor and lower bearing grommets.
3. Remove the top half of bearing clamp to replace the ball bearing assembly.
4. When re-inserting rotor shaft into the bearing holder, make certain the flat washer is placed between the rotor and bearing grommets.

TREBLE HORN

(See page 15 for exploded view of treble horn assembly.)

LUBRICATION:

It is not necessary to dismantle treble speaker assembly to oil the spindle. Simply apply a few drops of light machine oil to OIL HOLE in the treble horn.

TREBLE HORN SPINDLE REMOVAL:

1. Remove the entire treble speaker assembly from the cabinet.
2. Detach the three Phillips screws attaching spindle to the treble speaker mounting plate.

NOTE: When replacing treble horn spindle, be sure to first insert the neoprene washer; then the metal shim, on the spindle. This allows the treble horn to operate at the correct height, with the possibility of thrust bearing noises eliminated.

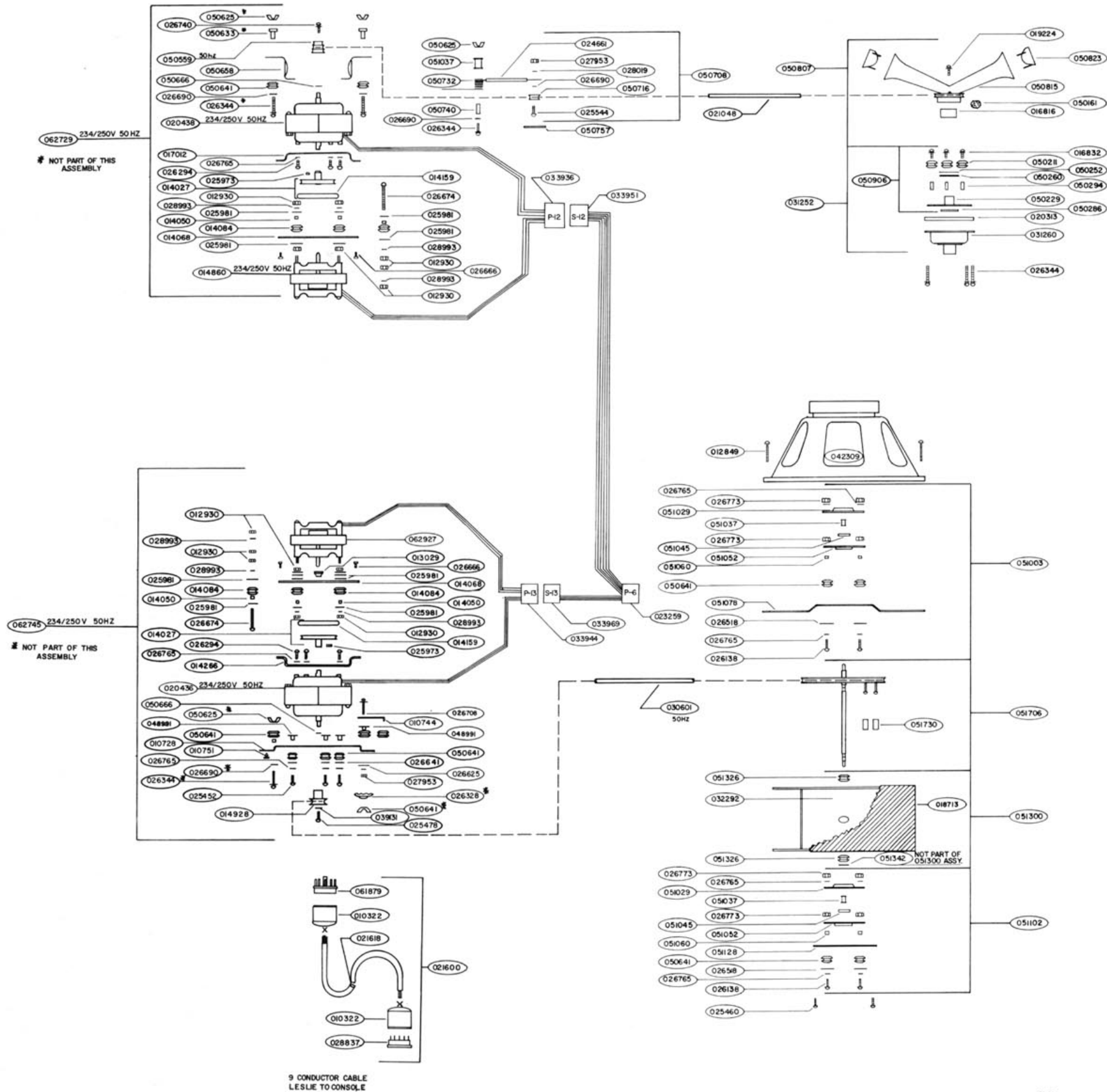
HORN REFLECTOR REPLACEMENT

To remove reflector, clip its three stand-off pins. Pull pins out of their horn holes. Install the new reflector with the cut edge facing upward when the horn is in operating position. To hold reflector without rattling, apply 3-M Weatherstrip Cement to the pins prior to insertion. Then, using a soldering iron, melt the ends of the stand-off pins to the outer horn surface to create a sturdy mechanical bond.

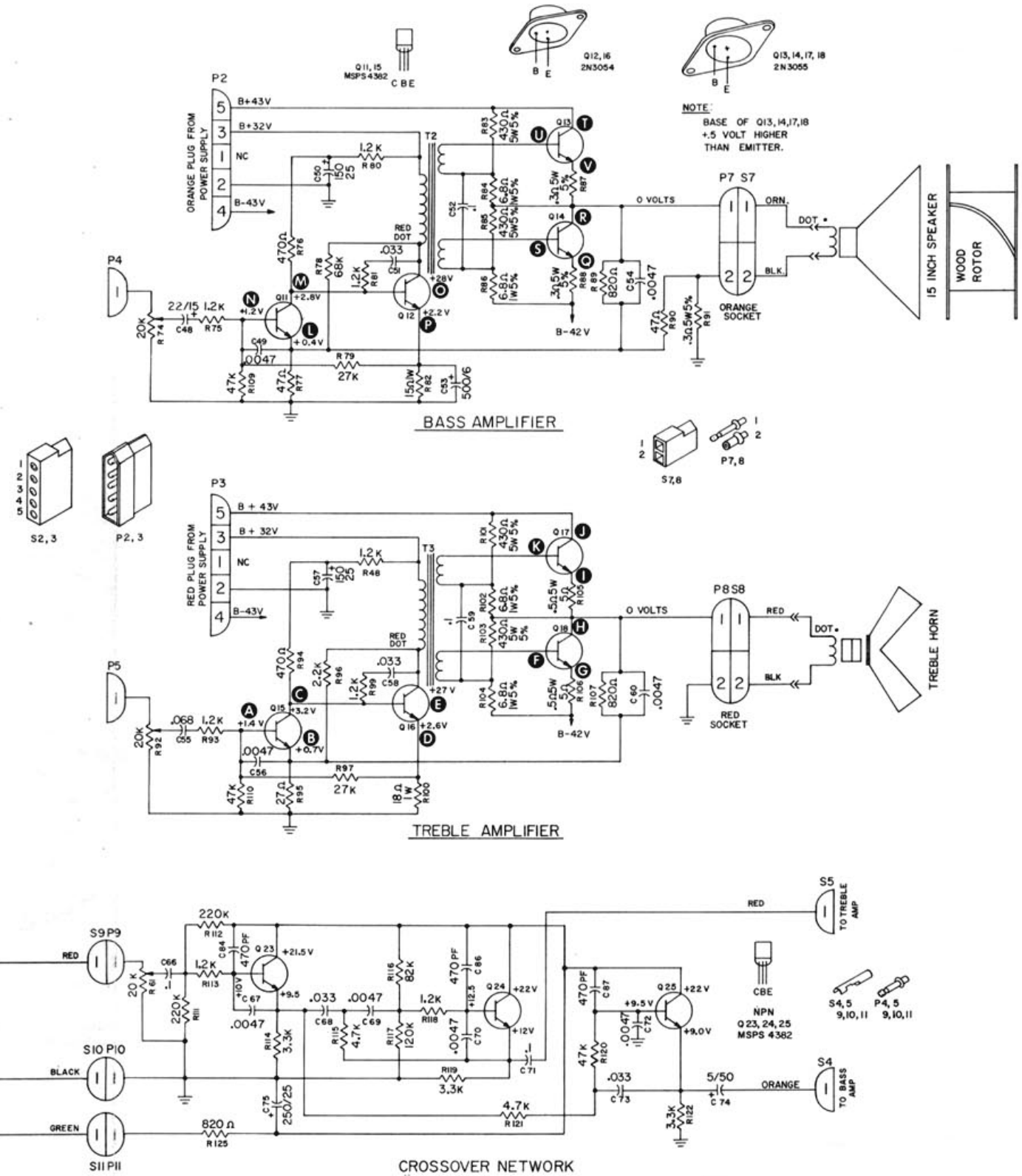
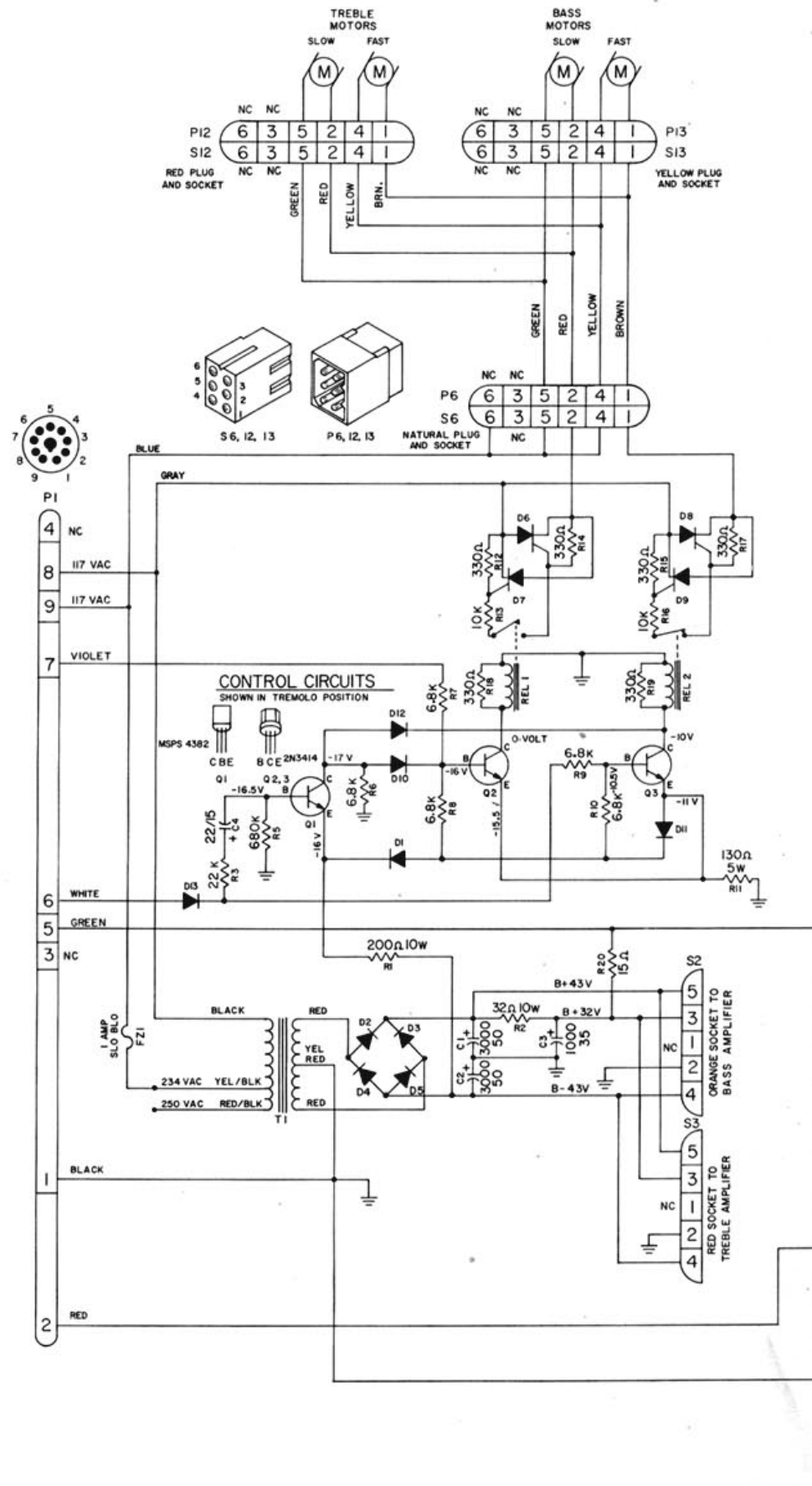
PARTS LIST: MODEL 760 SPEAKER MECHANICAL ASSEMBLY

EMI No.	Description	EMI No.	Description
010728	Bracket, Motor Mounting	047225	Speaker, 6" x 9", 16 Ohm
010744	Locking Lever	048991	Bushing, Shoulder, #10
010751	Bumper, Neoprene	050161	Filter, Acoustic — Treble Horn
012849	Screw, 10-24 x 1 1/4"	050211	Grommet
012930	Nut, Hex, 6-32 x 5/16" x 7/64"	050229	Spindle and Plate Assembly
013029	Slinger, Oil	050252	Washer, .876" x 1 3/8" x .012/.010"
014027	Pulley Assembly, Rim Drive	050260	Washer, 1-1/16" x 1 1/2" x 1/8"
014050	Bushing	050286	Washer, 5/8" x 1 1/2" x 1/8"
014068	Bracket, Small Motor Mounting	050294	Bushing
014084	Grommet	050500	Pulley, 3 Step, 60Hz
014159	Ring, "O" 2.475" ID	050559	Pulley, 3 Step, 50Hz
014266	Bracket, "U"	050625	Nut, Wing, 10-24
014860	Motor, Small, 234/250V, 50Hz	050633	Bushing, Shoulder
014928	Pulley, Motor, 50Hz	050641	Grommet
016816	Bearing Assembly, Treble Speaker	050658	"Z" Bracket, Motor Mounting
016832	Screw, 6-32 x 1 1/8"	050666	"C" Ring
017012	Bracket, "U"	050708	Idler Assembly
017525	Shield, Slow Motor Mount	050716	Pulley and Bearing Assembly, Idler
018713	Cover, Rotor, Large—Cloth	050732	Idler Spring
019224	Screw, 6-32 x 5/8"	050740	Bushing
020305	Speaker, Treble Driver, 16 Ohm	050757	Pad, Neoprene 1" x 4" x 1/8"
020313	Ring, Spacer, Treble Driver	050807	Treble Horn Assembly
020438	Motor, Large, 234/250V, 50Hz	050815	Treble Horn
021048	Belt, Drive, 50/60Hz, Graphited	050823	Reflector, Treble Horn Assembly
024661	Tubing, Neoprene 1/16" x 2 3/4"	050906	Spindle Assembly, Treble Horn
025452	Screw, 8-32 x 5/8"	051003	Support Assembly, Rotor, Upper
025460	Screw, 10-24 x 3/8"	051029	Rotor Bearing Retainer, Upper
025510	Screw, 10-24 x 2 3/4"	051037	Grommet
025544	Screw, 10-32 x 1/2"	051045	Ball Bearing, Rotor
025650	Screw, No. 10 x 7/8"	051052	Rotor Bearing Retainer, Lower
025973	Screw, 10-32 x 3/16"	051060	Bushing
025981	Washer, No. 6 x 9/16" x 3/64"	051078	Rotor Support, Upper
026138	Screw, 8-32 x 13/16"	051102	Ball Bearing Assembly, Lower Rotor
026294	Screw, 8-32 x 1/4"	051128	Plate, Bearing
026344	Screw, 10-24 x 1 1/2"	051201	Plate, Belt Adjusting
026518	Washer, No. 10 x 3/4" x 3/64"	051219	Screw and Wing Nut Assembly
026641	Washer, No. 8 x 31/32" x 1/16"	051300	Rotor and Grommet Assembly
026666	Screw, No. 6 x 1/4"	051326	Grommet
026674	Screw, 6-32 x 2 1/4"	051342	Washer 3/8" x 7/8" x 5/64"
026690	Washer, No. 10 x 1/2" x 1/16"	051706	Shaft and Pulley Assembly—Standard Cabinet
026708	Screw, 10-24 x 1 3/4" w/Int. Lockwasher	051730	Bushing, Rubber
026740	Screw, 8-32 x 3/8"	052308	Speaker, 15", 16 ohm
026765	Washer, Lock, No. 8 x 5/16" x .012"	052803	Crossover Assembly, 16 Ohm 800Hz
026773	Nut, Hex 8-32 x 11/32" x 1/8"	052829	Ring, Spacer, Crossover Network
027953	Nut, Hex 10-32 x 3/8" x 1/8"	062729	Motor Assembly, 2 Speed, 234/250V, 50Hz
028019	Washer, Lock No. 10 x 3/8" x .022"	062927	Motor, Small, Clockwise 234/250V, 50Hz
028076	Nut, Wire	P6	Molex Plug Housing, Natural 023591
028993	Washer, Lock, No. 6 x 9/32" x .018"	P6	Insert, Male 023309
030601	Belt, Drive, Lower, 50Hz	P2	Molex Plug Housing, Red 033936
031260	Speaker, Treble Driver, 16 ohm	P12	Insert, Male 023309
032292	Rotor, Wood 17" x 9"	S12	Molex, Socket Housing, Red 033951
037564	Motor Assembly, 2 Speed, 117V 60Hz	S12	Insert, Female 023556
042309	Speaker, 15", 4 ohm	P13	Molex Plug Housing, Yellow 033944
044685	Motor Assembly, 2 Speed, 117V 60Hz Shielded	P13	Insert, Male 023309
045880	Motor Assembly, 2 Speed 117V 50Hz Shielded	S13	Molex Socket Housing, Yellow 033969
045898	Motor Assembly, 2 Speed 117V 50Hz	S13	Insert, Female 023309

EXPLODED VIEW: MODEL 760 SPEAKER MECHANICAL ASSEMBLY



SCHEMATIC: MODEL 760 SPEAKER



PLUGS & SOCKETS

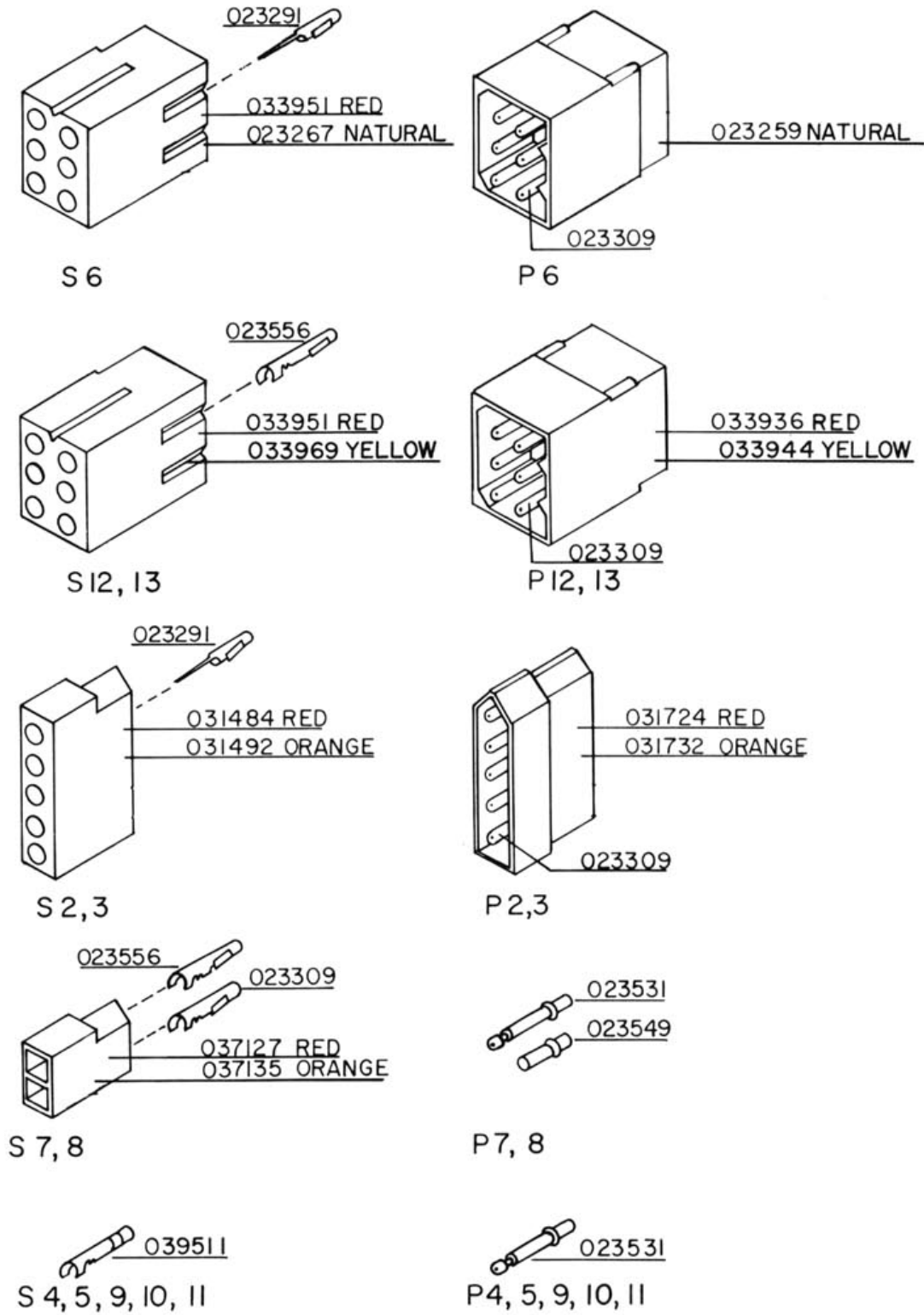


Fig. 14

